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10/668,574	09/23/2003	Mayuko Okada	501152.20022	3046

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EXAMINER

SHOSHO, CALLIE E

ART UNIT

PAPER NUMBER

1714

DATE MAILED: 08/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/668,574

Applicant(s)

OKADA ET AL.

Examiner

Callie E. Shosho

Art Unit

1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 August 2006.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2,4-8 and 10-12 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1,2,4-8 and 10-12 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

1. All outstanding rejections are overcome by applicants' amendment filed 8/3/06.

In light of the new grounds of rejection set forth below, the following action is non-final and thus, the finality of the previous office action has been withdrawn.

**Claim Rejections - 35 USC § 102**

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 7-8 and 10-12 are rejected under 35 U.S.C. 102(e) as being anticipated by Valentini et al. (U.S. 2005/0020730).

Valentini et al. disclose ink jet ink comprising water, 0.01-10% self-dispersing carbon black, 1-15% glycol ether such as dipropylene glycol mono-n-propyl ether, and 0.6-2% acrylic copolymer. It is calculated that the ratio of dipropylene glycol mono-n-propyl ether to acrylic copolymer is 0.5 (1/2) to 25 (15/0.6) (paragraphs 2-3, 14-17, 42, 43 (line 14), 44, 46, 50, 82, and 89). Although there is no explicit disclosure of ink cartridge containing the ink, Valentini et al. disclose that the ink is printed onto substrate from ink jet printer that would inherently possess ink cartridge to store the ink.

In light of the above, it is clear that Valentini et al. anticipate the present claims.

**Claim Rejections - 35 USC § 103**

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-2 and 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koga et al. (U.S. 2003/0073759).

Koga et al. disclose ink jet ink comprising water, pigment such as carbon black, 0.01-20% acrylic polymer, and 4-10% glycol ethers including tripropylene glycol n-butyl ether. It is disclosed that the pigment is surface treated, i.e. self-dispersing. It is calculated that the ratio of glycol ether to acrylic polymer is 0.2 (4/20) – 1000 (10/0.01) (paragraphs 1, 4, 13-15, 20-21, 24, 26, 28 (line 8), 30, 33, 42(line 6), 43(line 6), 44, and 50). Although there is no explicit disclosure of ink cartridge containing the ink, Koga et al. disclose that the ink is printed onto substrate from ink jet printer that would intrinsically possess ink cartridge to store the ink.

It is noted that the present claims require ratio of tripropylene glycol n-butyl ether to acrylic resin of 0.5-2 while Koga et al. disclose ratio of 0.2-1000 and present claims require 0.5-5% tripropylene glycol n-butyl ether and 0.1-5% acrylic polymer while Koga et al. disclose 4-10% tripropylene glycol n-butyl ether and 0.01-20% acrylic polymer.

As set forth in MPEP 2144.05, in the case where the claimed range “overlap or lie inside ranges disclosed by the prior art”, a *prima facie* case of obviousness exists, *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). Further, Koga et al. disclose the use of 4-10% glycol ether in order to reduce color bleed and disclose the use of 0.01-20% to produce ink with good dispersion stability. It therefore would have been within the skill level of one of ordinary skill in the art to choose amounts of tripropylene glycol n-butyl ether and acrylic polymer including those that result in ratio as presently claimed in order to produce ink with both reduced color bleed and good dispersion stability.

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use tripropylene glycol n-butyl ether and acrylic polymer in Koga et al. in amounts and

ratio, including that presently claimed, in order to produce ink with reduced color bleed and good dispersion stability, and thereby arrive at the claimed invention.

7. Claims 7-8 and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato (U.S. 6,440,203).

Kato discloses ink jet ink comprising water, 0.1-10% self-dispersing carbon black, acrylic resin which is a dispersant for a second colorant present in the ink, and 1-20% solvent such as dipropylene glycol mono-n-propyl ether. Given that the ratio of self-dispersing carbon black to second colorant is 1:3 to 7:1, given that the amount of self-dispersing pigment and second colorant is not more than 20%, and given that the acrylic resin is present in amount of 5-150% of second colorant, it is calculated that the acrylic resin is present in amount of 0.75-22.5%. The ratio of dipropylene glycol mono-n-propyl ether to acrylic resin is therefore calculated as 0.04 (1/22.5) to 20 (15/0.75) (col.1, lines 9-10, col.2, lines 33-35 and 40-41, col.3, lines 55-58, col.4, lines 43-48, col.5, line 3, col.7, lines 42-46, col.8, lines 2-3 and 6-8, and col.14, lines 3-9). Although there is no explicit disclosure of ink cartridge containing the ink, Kato et al. disclose that the ink is printed onto substrate from ink jet printer that would intrinsically possess ink cartridge to store the ink.

It is noted that the present claims require ratio of dipropylene glycol mono-n-propyl ether to acrylic resin of 0.5-2 while Kato et al. disclose ratio of 0.04-20 and present claims require amount of 0.5-5% dipropylene glycol mono-n-propyl ether and 0.1-5% acrylic polymer while Kato discloses 1-20% dipropylene glycol mono-n-propyl ether and 0.75-22.5% acrylic resin.

As set forth in MPEP 2144.05, in the case where the claimed range “overlap or lie inside ranges disclosed by the prior art”, a *prima facie* case of obviousness exists, *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). Further, Kato discloses the use of 1-20% dipropylene glycol mono-n-propyl ether as penetrating agent and disclose the use of 0.75-22.5% acrylic polymer as dispersant. It therefore would have been within the skill level of one of ordinary skill in the art to choose amounts of dipropylene glycol mono-n-propyl ether and acrylic polymer including those that result in ratio as presently claimed in order to produce ink with effective penetration into substrate and good dispersion stability.

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use dipropylene glycol mono-n-propyl ether and acrylic resin in Kato in amounts and ratio, including that presently claimed, in order to produce ink with effective penetration into substrate and good dispersion stability, and thereby arrive at the claimed invention.

8. Claims 7 and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Segawa et al. (U.S. 2004/0024086).

Segawa et al. disclose ink jet ink comprising water, 0.1-20% pigment, 1-20% glycol ether such as dipropylene glycol mono-n-propyl ether, and acrylic polymer dispersant. There is also disclosed ink cartridge containing the ink (paragraphs 18, 27, 33, 36 (lines 3-4), 65 (lines 17-18), and 79).

There is no explicit disclosure in Segawa et al. of ratio of dipropylene glycol mono-n-propyl ether to acrylic polymer as presently claimed.

Attention is drawn to example 7 of Segawa et al. that discloses ink comprising 12.5% pigment dispersion comprising approximately 17% (5/30) acrylic polymer (dispersant) and 3% triethylene glycol monobutyl ether from which it is calculated that the ink comprises approximately 2.1% acrylic polymer and thus, it is calculated that the ratio of glycol ether to acrylic polymer is approximately 1.4 (3/2.1).

Given that Segawa et al. disclose the equivalence and interchangeability of using triethylene glycol monobutyl ether with using dipropylene glycol mono-n-propyl ether as penetrating agent (paragraph 65), it therefore would have been obvious to one of ordinary skill in the art to use dipropylene glycol mono-n-propyl ether in the ink in amount of 3% and in ratio of dipropylene glycol mono-n-propyl ether to acrylic polymer of 1.4, and thereby arrive at the claimed invention.

### **Response to Arguments**

9. Applicants' arguments filed 8/3/06 have been fully considered but they are not persuasive.

Specifically, applicants argue that neither Koga et al. nor Kato disclose any interaction between tripropylene glycol n-butyl ether or dipropylene glycol mono-n-propyl ether, respectively, and acrylic polymer. Additionally, applicants argue that it would not have been obvious to use amounts of tripropylene glycol n-butyl ether or dipropylene glycol mono-n-propyl ether as presently claimed or ratio of tripropylene glycol n-butyl ether or dipropylene glycol mono-n-propyl ether to acrylic polymer as presently claimed in either Koga et al. or Kato. Applicants further argue that neither Koga et al. or Kato disclose the effect on straight line travel



stability or recording head discharge stability by adding tripropylene glycol n-butyl ether or dipropylene glycol mono-n-propyl ether, respectively, to ink containing acrylic polymer.

Applicants also argue that each of Koga et al. and Kato utilize acrylic polymer as dispersant rather than for use to improve recovery performance and fixation performance.

While it is agreed that Koga et al. do not disclose any interaction between tripropylene glycol n-butyl ether and acrylic polymer and Kato do not disclose any interaction between dipropylene glycol mono-n-propyl ether and acrylic polymer, the fact remains that Koga et al. and Kato each disclose ratio of their glycol ether to acrylic polymer that overlaps that presently claimed.

As set forth in MPEP 2144.05, in the case where the claimed range “overlap or lie inside ranges disclosed by the prior art”, a *prima facie* case of obviousness exists, *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). Further, Koga et al. disclose the use of 4-10% glycol ether in order to reduce color bleed and disclose the use of 0.01-20% to produce ink with good dispersion stability. It therefore would have been within the skill level of one of ordinary skill in the art to choose amounts of tripropylene glycol n-butyl ether and acrylic polymer including those that result in ratio as presently claimed in order to produce ink with both reduced color bleed and good dispersion stability. Similarly, Kato et al. disclose the use of 1-20% dipropylene glycol mono-n-propyl ether as penetrating agent and 0.75-22.5% as dispersant.

Therefore, it is the examiner’s position that it would have been obvious to one of ordinary skill in the art to use tripropylene glycol n-butyl ether and acrylic polymer in Koga et al. in amounts and ratio, including that presently claimed, in order to produce ink with reduced color

bleed and good dispersion stability, and thereby arrive at the claimed invention. It would also have been obvious to one of ordinary skill in the art to use dipropylene glycol mono-n-propyl ether and acrylic polymer in Kato in amounts and ratio, including that presently claimed, in order to produce ink with effective penetration into substrate and good dispersion stability, and thereby arrive at the claimed invention.

Although there is no disclosure in Koga et al. or Kato that the tripropylene glycol n-butyl ether or dipropylene glycol mono-n-propyl ether, respectively, are each utilized to effect straight line travel stability or recording head discharge stability or that the acrylic polymer is utilized to improve recovery performance and fixation performance, given that Koga et al. and Kato each disclose amount of tripropylene glycol n-butyl ether or dipropylene glycol mono-n-propyl ether and ratio of tripropylene glycol n-butyl ether or dipropylene glycol mono-n-propyl ether to acrylic polymer that overlaps that presently claimed, and given that it would have been obvious to one of ordinary skill in the art to chose amounts and ratio as presently claimed, it is clear that the ink of Koga et al. or Kato would therefore intrinsically possess good straight line travel stability and recording head discharge stability as well as improved recovery performance and fixation performance, and thereby arrive at the claimed invention.

Applicants argue that the range of dipropylene glycol n-propyl ether to acrylic polymer disclosed by Kato is much broader than the narrow range presently claimed. As evidence to support their position, applicants calculate the ratio of dipropylene glycol n-propyl ether to acrylic polymer as at least 0.044.

It is agreed that the lower limit of the ratio of dipropylene glycol n-propyl ether to acrylic polymer of Kato is calculated as 0.044. Similarly, it is calculated that the upper limit of the ratio is 0.9. Thus, the ratio of dipropylene glycol n-propyl ether to acrylic polymer disclosed by Kato does overlap that presently claimed.

As set forth in MPEP 2144.05, in the case where the claimed range “overlap or lie inside ranges disclosed by the prior art”, a *prima facie* case of obviousness exists, *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990).

Applicants argue that neither Koga et al. nor Kato is a relevant reference against the present claims in light of the unexpected results found in the present specification, namely, as set forth in paragraph 16 and Table 12.

It is noted that the data compares ink within the scope of the present claims, i.e. comprising acrylic polymer and tripropylene glycol n-butyl ether or acrylic polymer and dipropylene glycol mono-n-propyl ether, with ink outside the scope of the present claims, i.e. comprising no acrylic polymer and tripropylene glycol n-butyl ether, comprising acrylic polymer and no glycol ethers, comprising acrylic polymer and tripropylene glycol methyl ether, comprising acrylic polymer and diethylene glycol diethyl ether, comprising acrylic polymer and triethylene glycol diethyl ether, and comprising triethylene glycol dimethyl ether and salt of copolymer of acrylic acid/sulfonic acid monomer. It is shown that the inks of the present invention are superior in terms of recovery performance, straight travel stability, fixation, and/or drying.

However, there is no evidence of unexpected or surprising results regarding the amount of glycol ether or the ratio of glycol ether to acrylic polymer. That is, while the comparative data set forth in the present specification establishes the criticality of using tripropylene glycol n-butyl ether, dipropylene glycol n-propyl ether, and acrylic polymer, Koga et al. and Kato each already disclose the use of tripropylene glycol n-butyl ether or dipropylene glycol mono-n-propyl ether and acrylic polymer. There is no data, however, that establishes criticality regarding the amount of tripropylene glycol n-butyl ether, dipropylene glycol mono-n-propyl ether, or acrylic polymer or ratio of tripropylene glycol n-butyl ether or dipropylene glycol n-propyl ether to acrylic polymer.

Further, while paragraph 16 of the present specification discloses the preferred amount of tripropylene glycol n-butyl ether or dipropylene glycol n-propyl ether utilized and discloses the ratio of tripropylene glycol n-butyl ether or dipropylene glycol n-propyl ether to acrylic polymer and pages 7, 9, 12, and 14 of applicants' amendment filed 8/3/06 describes the results found when utilizing the presently claimed amount of tripropylene glycol n-butyl ether or dipropylene glycol n-propyl ether or ratio as presently claimed, there is no evidence, i.e. data, to support applicants' position regarding these unexpected results.


Applicants argue that Valentini et al. is not a relevant reference against the present claims given that the 102(e) date of Valentini et al. of 5/11/04 is predated by the 102(e) date of the present invention.

However, it is noted that it is the examiner's position that the 102(e) date of Valentini et al. is 5/19/03 (provisional) and thus, Valentini et al. is a proper reference against the present claims.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 571-272-1123. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
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